

ABSTRACT

The first pulse width T_1 and the first peak value I_{p1} of the electric discharge current are set so that the electric current density between the electrode (1) and the workpiece (2) can be in a predetermined range to suppress the emission of the electrode material, and under the condition that the diameter of the electric discharge arc column (10) is sufficiently extended in the section of the first pulse width T_1 , the electric discharge current is increased to the second peak value I_{p2} so that a quantity of supply of the hard coat material by the emission of the electrode material can be a value which has been previously set according to a predetermined processing condition. In this way, electric discharge is created between the electrodes, and the hard coat (17) is effectively formed on the workpiece (2). Therefore, it is possible to reduce the cost of surface treatment, and the tight hard coat (17) can be formed on the workpiece (2).